

(11)Publication number : 09-008116
 (43)Date of publication of application : 10.01.1997

(51)Int.Cl. H01L 21/68
 B65G 49/07
 // B65D 85/86

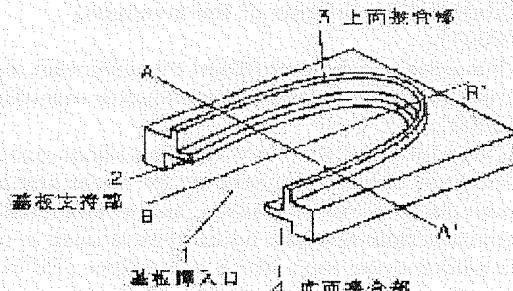
(21)Application number : 07-148704 (71)Applicant : MATSUSHITA ELECTRIC IND CO LTD
 (22)Date of filing : 15.06.1995 (72)Inventor : KAWASAKI SATOKO

(54) BOARD CONVEYING JIG AND SEMICONDUCTOR MANUFACTURING DEVICE

(57)Abstract:

PURPOSE: To lessen the adhesion of particles to a board, and to improve the yield of production of a semiconductor manufacturing device.

CONSTITUTION: The title board conveying jig is made of tabular material and a sheet of board can be housed therein, a board inserting inlet 1, with which a board is taken out or taken in by moving it horizontally, is provided on the side face of the board, space where the arm of a semiconductor manufacturing device goes in and out is provided, an upper surface junction part 3 is formed on the upper part of outer circumference of the board, and a bottom face junction part 4, which is coincided with the protrusion of the upper surface junction part, is formed on the bottom face of outer circumference. A projection or a protruding part, which is coincided with the bottom face junction part 4 of the board conveying jig is provided on the loader part and the unloader part of the semiconductor manufacturing device, and an arm, with which the board is delivered between the board conveying jig and the semiconductor manufacturing device, is provided.



* NOTICES *

JPO and INPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1]A substrate transportation jig characterized by forming an uneven part which fits into the upper part side and each lower part side in the side corresponding to a substrate face rear face of a sliding direction to an opening and an opening which can take a substrate in and out of the side where thickness is thin with a bigger [than a substrate]-shaped board.

[Claim 2]A semiconductor manufacturing device provided with an arm out of which it has come to carry out direct carrying of structure where only arbitrary number of sheets of a substrate can install the substrate transportation jig according to claim 1 in a loader part unloader part of a semiconductor manufacturing device in piles, and the substrate, between a substrate transportation jig and a device.

[Claim 3]The substrate transportation jig according to claim 1 giving an inclination to a substrate supporting part of a board so that the opening side of a substrate may incline up.

[Claim 4]The substrate transportation jig according to claim 1 forming a mechanism of a substrate skid in a substrate periphery by the side of an opening of a substrate supporting part.

[Claim 5]The substrate transportation jig according to claim 1 forming a board with resin raw materials with few volatile organic substances.

[Claim 6]The substrate transportation jig according to claim 1 forming by resin which does not have volatilization of an organic matter in use at a room temperature.

[Claim 7]The substrate transportation jig according to claim 1 which used an organic matter made from volatilization which does not adhere to a stored substrate easily as resin raw materials.

[Translation done.]

* NOTICES *

JPO and INPI are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]When this invention manufactures a semiconductor device, it relates to a required substrate transportation jig and semiconductor manufacturing device.

[0002]

[Description of the Prior Art]The silicon substrate which is the raw material of a semiconductor device is conveyed and kept between devices as 25-sheet one batch to the size with a caliber of 8 inches in semiconductor device manufacture in many cases, and when installed in a semiconductor manufacturing device, the substrate transportation jig of a batch type is used in many cases. In recent years, large caliber-ization of a silicon substrate is said and the next which is a caliber of 8 inches changes to 12 inches. If it becomes large-caliber-izing of a silicon substrate, and the small-quantity multiproduct production of a semiconductor device, the number of sheets of the silicon substrate used for one lot will decrease from the present. In order to prevent the fall of the device yield by particle attachment in semiconductor device manufacture, pure silicon substrate peripheral environment is needed.

[0003]An example of the above-mentioned conventional substrate transportation jig is explained referring to drawings below.

[0004]Drawing 8 shows the outline of the conventional substrate transportation jig. In drawing 8, 20 is an opening and 21 is a substrate supporting part. About the substrate transportation jig constituted as mentioned above, the operation is explained below.

[0005]As for the substrate transportation jig, the outside of a substrate and the isomorphism-like opening 20 are formed in the center. The substrate supporting part 21 for supporting the outer periphery part of a substrate is formed in the lower part of the opening 20. A substrate is inserted from the opening 20 and installed on the substrate supporting part 21. The substrate transportation jig which stored the substrate is detached and attached by the semiconductor manufacturing device as it is, and a substrate is conveyed in a semiconductor manufacturing device. (For example, JP,6-204330,A).

[0006]

[Problem(s) to be Solved by the Invention]However, when the substrate of total is not stored by one batch in the above composition, The space volume which touches the surface of one substrate with large caliber-ization of a substrate became large, and it had the problem of particle adhering to a substrate face easily, and particle having adhered and so reducing the device yield during substrate transportation storage as compared with the case where total is being kept. Big space is needed unnecessary for the storage place of a substrate with large caliber-ization of a substrate.

[0007]This invention reduces the particle which adheres to a substrate face during substrate transportation and storage in view of the above-mentioned problem, and when keeping a substrate, it provides the substrate transportation jig for not producing useless space.

[0008]

[Means for Solving the Problem]In order to solve the above-mentioned problem a substrate transportation jig of this invention, Although an opening which is a tabular thing which can store one substrate, makes it move to the side of a board horizontally, and can take a substrate in and out of it, and a substrate are taken in and out. An upper part periphery of space which an arm of a required semiconductor manufacturing device can frequent, and a board is equipped with composition of providing a crevice which agrees with a projection of said upper part periphery on a

projection and a pars-basilaris-ossis-occipitalis periphery. A semiconductor manufacturing device is considered as composition which equipped a device loader part and an unloader part with a projection or heights which agrees with a crevice of the bottom of a first half substrate transportation jig, and was provided with an arm which delivers a substrate between a first half substrate transportation jig and inside of a semiconductor manufacturing device.

[0009]

[Function] By the above-mentioned composition, this invention becomes possible [storing per one substrate], can reduce the particle which adheres to a substrate by making space volume to a substrate face into the minimum, can aim at improvement in the yield of a semiconductor device, and can make the minimum space required at the time of substrate storage.

[0010]

[Example] Hereafter, the substrate transportation jig of one example of this invention is explained, referring to drawings.

[0011] Drawing 1 shows the outline of the substrate transportation jig in the example of this invention. As for a substrate loading slot and 2, in drawing 1, an upper surface joined part and 4 are bottom joined parts a substrate supporting part and 3 1.

[0012] About the substrate transportation jig constituted as mentioned above, the operation is explained using drawing 1, drawing 2, and drawing 3 below.

[0013] First, drawing 2 (A) shows the A-A' section in the state where five substrate transportation jigs of drawing 1 were piled up, the substrate supporting part of 2, the upper surface joined part of 3, and the bottom joined part of 4 are the same composition as drawing 1, and the substrate with which 5 was stored by the substrate transportation jig, and 6 show the lid of a substrate transportation jig.

[0014] Drawing 2 (B) shows the B-B' section in the state where five substrate transportation jigs of drawing 1 were piled up, the substrate loading slot of 1, the substrate supporting part of 2, the upper surface joined part of 3, and the bottom joined part of 4 are the same composition as drawing 1, and the substrate with which 5 was stored by the substrate transportation jig, and 7 show the lid of a substrate transportation jig.

[0015] In drawing 3 (A), 10 is a semiconductor manufacturing device, and 11 is an arm, and in order that it may exchange a substrate between a substrate transportation jig and a semiconductor manufacturing device, it is a thing. In drawing 3 (B), the loader part of the semiconductor manufacturing device 10 and the unloader part are equipped with the projection or heights which agrees with the bottom joined part 4 of a substrate transportation jig like drawing 3 (A).

[0016] When from the upper surface of the substrate supporting part 2 to the bottom of a lid is made into the space to the substrate 5 about the substrate transportation jig of the highest rung in drawing 2 from the upper surface of the substrate supporting part 2 to the tip of the upper surface joined part 3, the space should just be the minimum space where the arm of a semiconductor manufacturing device can pick out the substrate 5 from a substrate transportation jig. In order to prevent the substrate 5 moving during storage conveyance in the substrate loading slot 1 side, the inclination is given to the substrate supporting part 2 so that it is close to the substrate loading slot 1, and it may become close to the upper surface of a substrate transportation jig. In order to prevent the particle attachment to the substrate 5 stored by the substrate transportation jig of the highest rung, the lid which has the bottom corresponding to the upper surface joined part 3 of a substrate transportation jig is installed.

[0017] In drawing 3 (A), the loader part of the semiconductor manufacturing device 10 and the unloader part are equipped with the projection or heights which agrees with the bottom joined part 4 of a substrate transportation jig. The substrate in the substrate transportation jig placed on the semiconductor manufacturing device 10 is conveyed in the semiconductor manufacturing device 10 by the arm 11, and is again returned in a substrate transportation jig after substrate treatment. In drawing 3 (B), the loader part of the semiconductor manufacturing device 10 and the unloader part are equipped with the projection or heights which agrees with the bottom joined part 4 of a substrate transportation jig like drawing 3 (A). The substrate transportation jig which stored the substrate 5 installed in the loader part and the unloader part may be transferred to the vacuum chamber in the semiconductor manufacturing device 10 as it is.

[0018] In the substrate transportation jig and semiconductor manufacturing device which were constituted as mentioned above. When storing the substrate loading slot 1 and the substrate 5 which are made to move one substrate horizontally and can be taken in and out. Space which receives per substrate by forming the bottom joined part 4 which agrees with said projection as the upper surface joined part 3 at a projection and a circumference pars basilaris ossis occipitalis in the space which the arm 11 of the semiconductor manufacturing device 10 can frequent, and the circumference upper part can be made into the minimum. Since it is not necessary to transfer a substrate out of a semiconductor manufacturing device, the particle attachment to the substrate from clean room environment can be suppressed, and the yield fall of a semiconductor device can be prevented. The space at the time of substrate storage can also be held down to necessary minimum.

[0019] Next, the substrate transportation jig of the second example of this invention is explained, referring to drawing 6 and drawing 7.

[0020] Drawing 6 shows the schematic diagram of the substrate transportation jig of the second example. In drawing 6, the substrate loading slot of 1, the substrate supporting part of 2, and the upper surface joined part of 3 achieve a function equivalent to the first example shown in drawing 1. 6 achieves the duty which shows a substrate holding part and supports the inserted substrate. Drawing 7 shows a C-C' section when six substrate transportation jigs shown in drawing 6 are piled up. In drawing 7, the substrate loading slot of 1, the substrate supporting part of 2, and the substrate holding part of 6 are the same as that of drawing 6, and 5 is the substrate inserted in the substrate

transportation jig.

[0021]The function is explained about the substrate transportation jig constituted as mentioned above. This substrate transportation jig has the substrate loading slot 1 caudad, and all transfers of the substrate 5 to a semiconductor manufacturing device are performed by turning caudad. A substrate transportation jig is installed in the predetermined place of a semiconductor manufacturing device. Then, the substrate 5 in a substrate transportation jig by the arm of a semiconductor manufacturing device. It is once raised above the substrate holding part 6, and after being moved to the outside of the substrate holding part 6 in the state, then being moved caudad, being conveyed in a semiconductor manufacturing device and performing required processing, it is again returned in a substrate transportation jig by the arm of a semiconductor manufacturing device. Although the sectional view at the time of piling up six substrate transportation jigs in drawing 7 is shown, the substrate 5 is not inserted in order to prevent the particle attachment of ***** about the substrate transportation jig in which the substrate supporting part 2 and the substrate holding part 6 become the outermost surface. Since the crevice which makes the upper surface joined part 3 the shape which can be hooked, and fits into this is formed in the bottom in drawing 6, as shown in drawing 7, the substrate transportation jig can pile up arbitrary number of sheets.

[0022]In the 1st example, it presupposed that an inclination is given so that the substrate supporting part 2 was close to the substrate loading slot 1, and it might become close to the upper surface of a substrate transportation jig, but. An inclination is not attached to the substrate supporting part 2, but as shown in drawing 4 and drawing 5, the substrate holding part 6 may be formed in the position in alignment with the peripheral part of the substrate 5, when the substrate 5 is stored on the substrate supporting part 2. Although the upper surface joined part 3 and the bottom joined part 4 were made into the shape which encloses the circumference by which the substrate 5 is stored, if a substrate transportation jig can be piled up, it does not matter as a structure of having a crevice into which the upper surface joined part 3 fits into with a projection, and the bottom joined part 4 fits with the projection of the upper surface joined part 3. Conversely, the bottom joined part 4 has a projection and the crevice which fits into this may turn into the upper surface joined part 3. In the second example, the upper surface joined part 3 will not be cared about as easy uneven shape, if it joins just when a substrate transportation jig is piled up, although it was considered as the shape to hook. It may not adhere to an upper surface joined part and a bottom joined part, but the stops which join each substrate transportation jig on the sides other than substrate loading slot 1 of a substrate transportation jig may be provided.

[0023]In drawing 7, although only one piece was provided in the lowermost end of the substrate 5, as long as the substrate holding part 6 can take out the substrate 5 by the arm of a semiconductor manufacturing device, it may be accompanied and provided in the peripheral part of the substrate 5.

[0024]It is also possible to attach a recognition table to each substrate transportation jig at a bar code etc., to recognize every one substrate, and to control a process because of the substrate transportation jig which can be stored per one substrate.

[0025]

[Effect of the Invention]By this invention, it is considered as the tabular jig which can carry out one substrate unit appearance storage of the substrate transportation jig as mentioned above, The upper part periphery of the space which the arm of a semiconductor manufacturing device required to take the opening which makes it move to the side of a board horizontally, and can take a substrate in and out of it, and a substrate in and out can frequent, and a board is equipped with the composition of providing the crevice which agrees with the projection of said upper part periphery on a projection and a pars-basilaris-ossis-occipitalis periphery, A semiconductor manufacturing device provides the composition and **** which equipped the device loader part and the unloader part with the projection or heights which agrees with the crevice of the bottom of a first half substrate transportation jig, and were provided with the arm which delivers a substrate between a first half substrate transportation jig and the inside of a semiconductor manufacturing device.

Therefore, improvement in the yield of a semiconductor device can be aimed at.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The schematic diagram of the substrate transportation jig in the 1st example of this invention
 [Drawing 2] The sectional view of the substrate transportation jig in the example
 [Drawing 3] The semiconductor manufacturing device for the explanation of operation in the example, and the sectional view of a substrate transportation jig
 [Drawing 4] The schematic diagram of the substrate transportation jig in the example
 [Drawing 5] The sectional view of the substrate transportation jig in the example
 [Drawing 6] The schematic diagram of the substrate transportation jig in the 2nd example of this invention
 [Drawing 7] The sectional view of the substrate transportation jig in the example
 [Drawing 8] The schematic diagram of the conventional substrate transportation jig

[Description of Notations]

- 1 Substrate loading slot
- 2 Substrate supporting part
- 3 Upper surface joined part
- 4 Bottom joined part
- 5 Substrate
- 6 Substrate holding part
- 7 Lid
- 10 Semiconductor manufacturing device
- 11 Arm
- 20 Opening
- 21 Substrate supporting part

[Translation done.]

* NOTICES *

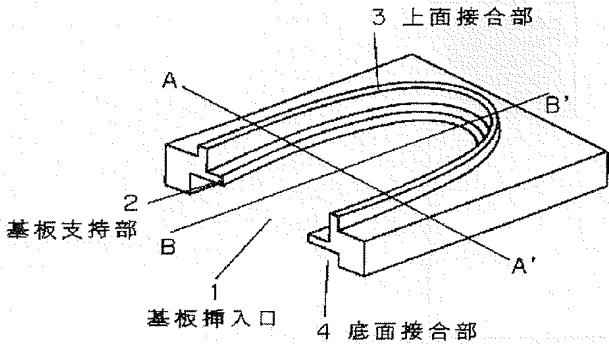
JPO and INPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]

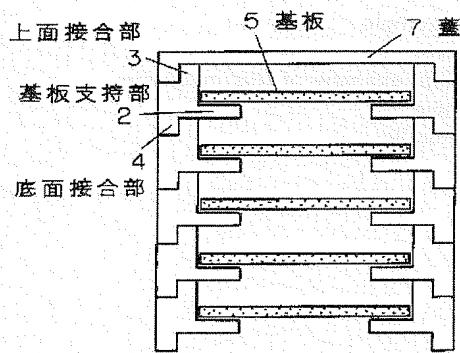
基板搬送治具概略図



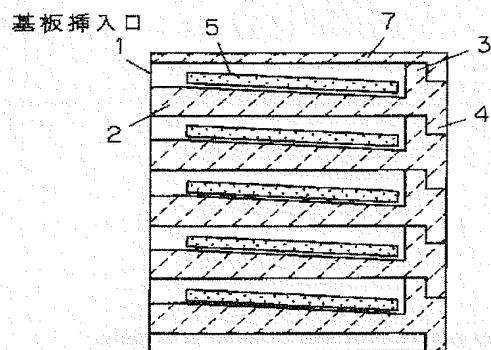
[Drawing 2]

基板搬送治具を5まい重ねた場合の断面図

(A) A-A'断面図



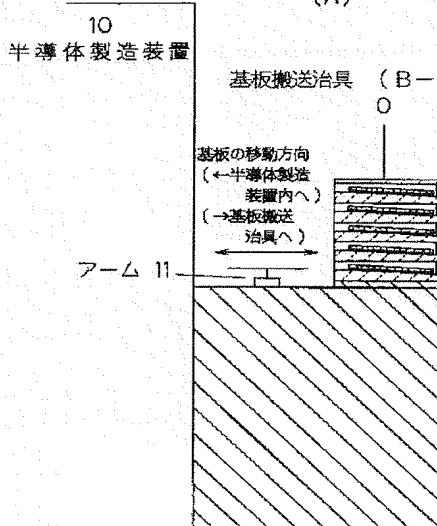
(B) B-B'断面図



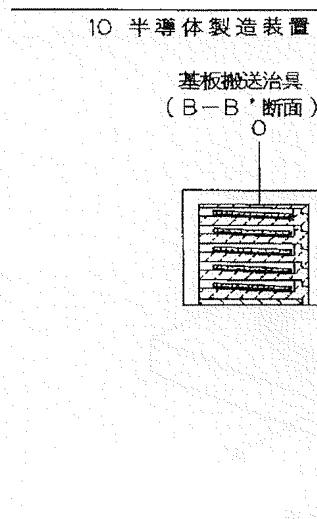
[Drawing 3]

基板搬送治具を半導体製造装置に設置したときの断面図

(A)

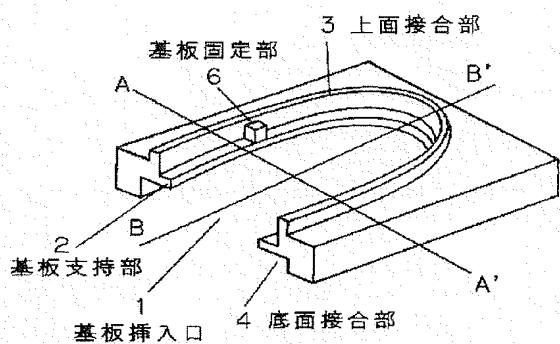


(B)



[Drawing 4]

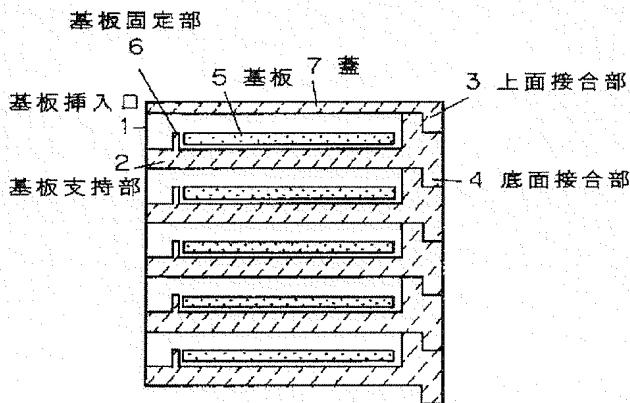
基板搬送治具概略図



[Drawing 5]

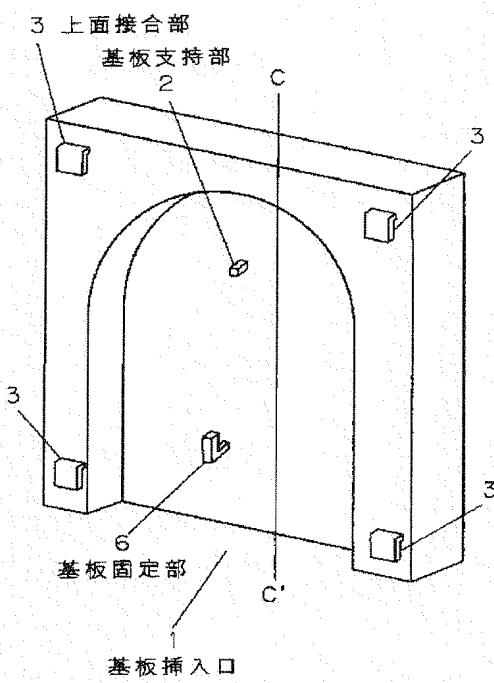
図4の基板搬送治具を5まい重ねた
場合のB-B'断面図

B-B'断面図

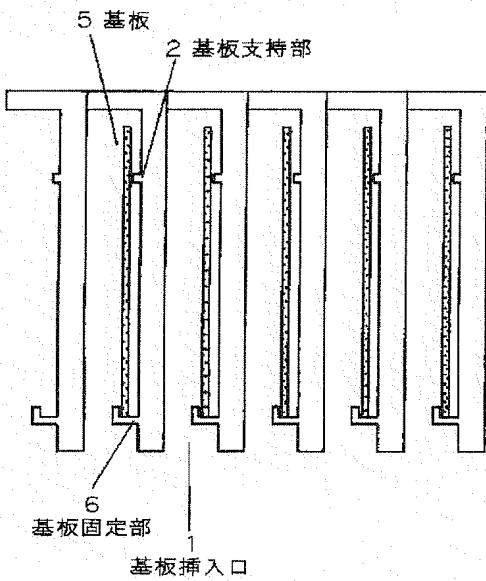


[Drawing 6]

基板搬送治具概略図

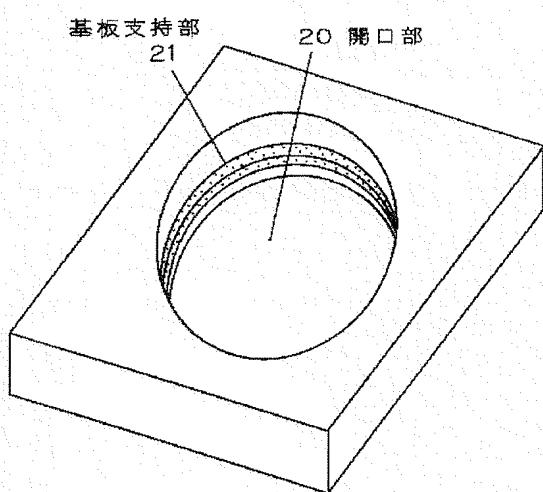


[Drawing 7]
基板搬送治具を6まい重ねた場合の断面図



[Drawing 8]

従来の基板搬送治具



[Translation done.]

(19)日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平9-8116

(43)公開日 平成9年(1997)1月10日

(51)Int.Cl. ⁶	識別記号	序内整理番号	F I	技術表示箇所
H 01 L 21/68			H 01 L 21/68	U
B 6 5 G 49/07			B 6 5 G 49/07	L
// B 6 5 D 85/86		0333-3E	B 6 5 D 85/38	R

審査請求 未請求 請求項の数7 ○L (全6頁)

(21)出願番号 特願平7-148704	(71)出願人 000005821 松下電器産業株式会社 大阪府門真市大字門真1006番地
(22)出願日 平成7年(1995)6月15日	(72)発明者 川崎 里子 大阪府門真市大字門真1006番地 松下電器 産業株式会社内

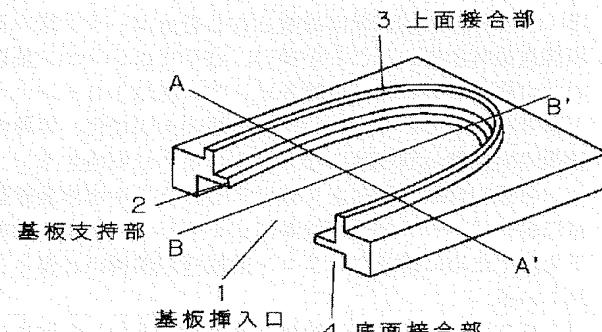
(54)【発明の名称】 基板搬送治具及び半導体製造装置

(57)【要約】

【目的】 基板へのパーティクル付着を低減しデバイス歩留まりを向上する。

【構成】 本発明の基板搬送治具は、基板1枚を収納できる板状のもので板の側面には基板を水平方向に移動させて出し入れできる基板挿入口1と、基板を出し入れするのに必要な半導体製造装置のアームが出入りできる空間と、板の上部外周には上面接合部3と、底部外周には前記上面接合部の突起と合致する底面接合部4とを備えた構成からなる。半導体製造装置は装置ローダー部、アンローダー部に前期基板搬送治具の底面接合部4と合致する突起あるいは凸部を備え、前期基板搬送治具と半導体製造装置内との間で基板の受渡を行なうアームを備えた構成とする。

基板搬送治具概略図



【特許請求の範囲】

【請求項1】基板より大きな形状の板で厚みの薄い側面に基板を出し入れできる開口部と開口部に対して上下方向の基板表面裏面に対応する側面には上方側面と下方側面それぞれに嵌合する凹凸部が形成されていることを特徴とする基板搬送治具。

【請求項2】請求項1記載の基板搬送治具を基板の任意の枚数だけ重ねて半導体製造装置のローダー部アンローダー部に設置することができる構造と基板を基板搬送治具と装置間で直接搬送することができるアームを備えたことを特徴とする半導体製造装置。

【請求項3】基板の開口部側が上方に傾くように板の基板支持部に傾斜を持たせたことを特徴とする請求項1記載の基板搬送治具。

【請求項4】基板支持部の開口部側の基板周辺部に基板滑り止めの機構を設けたことを特徴とする請求項1記載の基板搬送治具。

【請求項5】板を揮発性有機物の少ない樹脂原料で形成したことを特徴とする請求項1記載の基板搬送治具。

【請求項6】室温での使用において有機物の揮発が無い樹脂で形成したことを特徴とする請求項1記載の基板搬送治具。

【請求項7】収納した基板に付着しにくい揮発性有機物を樹脂原料とした請求項1記載の基板搬送治具。

【発明の詳細な説明】**【0001】**

【産業上の利用分野】本発明は半導体装置を製造する際に必要な基板搬送治具及び半導体製造装置に関するものである。

【0002】

【従来の技術】半導体装置製造にあたり半導体装置の原材料であるシリコン基板は口径8インチの大きさまでは25枚1パッチとして装置間搬送、保管されている事が多く、半導体製造装置に設置される場合はパッチ式の基板搬送治具を用いることが多い。近年ではシリコン基板の大口径化が言われ、口径8インチの次は12インチへと移り変わっていく。シリコン基板の大口径化、半導体装置の少量多品種生産になると1ロットに使用するシリコン基板の枚数は現在より減少する。また半導体装置製造においてパーティクル付着によるデバイス歩留りの低下を防ぐために清浄なシリコン基板周辺環境が必要とされている。

【0003】以下図面を参照しながら、上記した従来の基板搬送治具の一例について説明する。

【0004】図8は従来の基板搬送治具の概略を示すものである。図8において、20は開口部、21は基板支持部である。以上のように構成された基板搬送治具について、以下その動作について説明する。

【0005】基板搬送治具は中央に基板の外形と同形状の開口部20が形成されている。開口部20の下部には

基板の外周縁部を支持する為の基板支持部21が設けられている。基板は開口部20から挿入され基板支持部21上に設置される。基板を収納した基板搬送治具はこのまま半導体製造装置に着脱され半導体製造装置内に基板が搬送される。(例えば、特開平6-204330号公報)。

【0006】

【発明が解決しようとする課題】しかしながら上記のような構成では、1パッチに全数の基板が収納されない場合、基板の大口径化と共に基板1枚の表面に接する空間体積が大きくなり、それ故、基板表面にパーティクルが付着しやすくなり、全数保管している場合と比較して、基板搬送保管中にパーティクルが付着しデバイス歩留まりを低下させるという問題点を有していた。また、基板の大口径化と共に基板の保管場所に不必要に大きな空間が必要となる。

【0007】本発明は上記問題点に鑑み、基板搬送、保管中に基板表面に付着するパーティクルを低減し、基板を保管する時に無駄な空間を生じさせないための基板搬送治具を提供するものである。

【0008】

【課題を解決するための手段】上記問題点を解決するために本発明の基板搬送治具は、基板1枚を収納できる板状のもので板の側面には基板を水平方向に移動させて出し入れできる開口部と基板を出し入れするのに必要な半導体製造装置のアームが出入りできる空間と板の上部外周には突起と底部外周には前記上部外周の突起と合致する凹部を具備するという構成を備えたものであり、半導体製造装置は装置ローダー部、アンローダー部に前期基板搬送治具の底面の凹部と合致する突起あるいは凸部を備え、前期基板搬送治具と半導体製造装置内との間で基板の受渡を行なうアームを備えた構成とする。

【0009】

【作用】本発明は上記した構成によって基板1枚単位で収納することが可能となり、基板表面に対する空間体積を最小にすることで基板に付着するパーティクルを低減し半導体装置の歩留り向上を図り、基板保管時に必要な空間を最小にすることができます。

【0010】

【実施例】以下、本発明の一実施例の基板搬送治具について、図面を参照しながら説明する。

【0011】図1は本発明の実施例における基板搬送治具の概略を示すものである。図1において、1は基板挿入口、2は基板支持部、3は上面接合部、4は下面接合部である。

【0012】以上のように構成された基板搬送治具について、以下図1及び図2及び図3を用いてその動作を説明する。

【0013】まず図2(A)は図1の基板搬送治具を5枚重ねた状態のA-A'断面を示すものであって、2の

基板支持部、3の上面接合部、4の底面接合部は図1と同じ構成であり、5は基板搬送治具に収納された基板、6は基板搬送治具の蓋を示す。

【0014】図2(B)は図1の基板搬送治具を5枚重ねた状態のB-B'断面を示すものであって、1の基板挿入口、2の基板支持部、3の上面接合部、4の底面接合部は図1と同じ構成であり、5は基板搬送治具に収納された基板、7は基板搬送治具の蓋を示す。

【0015】図3(A)において10は半導体製造装置であり、11はアームであり基板搬送治具と半導体製造装置間で基板のやり取りを行うためものである。図3

(B)において半導体製造装置10のローダー部、アンローダー部には図3(A)と同様、基板搬送治具の底面接合部4と合致する突起あるいは凸部を備えている。

【0016】図2において基板支持部2の上面から上面接合部3の先端まで、最上段の基板搬送治具については基板支持部2の上面から蓋の底面までを基板5に対する空間とすると、空間は基板5を基板搬送治具から半導体製造装置のアームが取り出せるだけの最小限の空間であればよい。また、基板5が保管搬送中に基板挿入口1側移動するのを防ぐために基板支持部2には基板挿入口1に近いほど基板搬送治具の上面に近くなるように傾斜を持たせている。また最上段の基板搬送治具に収納された基板5へのパーティクル付着を防ぐために基板搬送治具の上面接合部3に合致する底面を有する蓋を設置する。

【0017】図3(A)において半導体製造装置10のローダー部、アンローダー部には基板搬送治具の底面接合部4と合致する突起あるいは凸部を備えており、半導体製造装置10上に置かれた基板搬送治具内の基板はアーム11により半導体製造装置10内に搬送され、基板処理後再び基板搬送治具内に戻される。図3(B)において半導体製造装置10のローダー部、アンローダー部には図3(A)と同様、基板搬送治具の底面接合部4と合致する突起あるいは凸部を備えている。ローダー部、アンローダー部に設置された基板5を収納した基板搬送治具はそのまま半導体製造装置10内の真空中に移載されてもよい。

【0018】以上のように構成された基板搬送治具および半導体製造装置では、基板1枚を水平方向に移動させて出し入れできる基板挿入口1と基板5を収納するとき半導体製造装置10のアーム11が出入りできる空間と周辺上部には上面接合部3として突起と周辺底部には前記突起と合致する底面接合部4を設けることにより基板1枚あたりに対する空間を最小にすることができる、また半導体製造装置外で基板を移載する必要がないため、クリーンルーム環境からの基板へのパーティクル付着を抑えることができ半導体装置の歩留り低下を防ぐことができる。また、基板保管時のスペースも必要最小限に抑えることができる。

【0019】次に本発明の第二の実施例の基板搬送治具

について、図6、図7を参照しながら説明する。

【0020】図6は第二の実施例の基板搬送治具の概略図を示すものである。図6において、1の基板挿入口、2の基板支持部、3の上面接合部は図1に示す第一の実施例と同等の機能を有する。6は基板固定部を示し、挿入した基板を支える役目を果たす。図7は図6に示す基板搬送治具を6枚重ねたときのC-C'断面を示す。図7において1の基板挿入口、2の基板支持部、6の基板固定部は図6と同様であり、5は基板搬送治具に挿入された基板である。

【0021】以上のように構成された基板搬送治具についてその機能を説明する。この基板搬送治具は基板挿入口1を下方に持ち、半導体製造装置への基板5の移載はすべて下方に向けて行われる。基板搬送治具は半導体製造装置の所定の場所に設置される。その後、基板搬送治具内の基板5は、半導体製造装置のアームにより、基板固定部6の上方に一度持ち上げられ、その状態で基板固定部6の外側に移動されて次に下方に移動され半導体製造装置内に搬送され必要な処理を施された後、再び半導体製造装置のアームにより基板搬送治具内に戻される。図7において基板搬送治具は6枚重ねた場合の断面図を示すが、基板支持部2、基板固定部6が最表面になる基板搬送治具については基板経のパーティクル付着を防止するため基板5を挿入しない。図6において上面接合部3は引っ掛けることのできる形状とし、これに嵌合する凹部が底面に形成されているため、図7に示すように基板搬送治具は任意の枚数を重ねることができる。

【0022】なお、第1の実施例において、基板支持部2は基板挿入口1に近いほど基板搬送治具の上面に近くなるように傾斜を持たせたが、基板支持部2に傾斜をつけず、図4、図5に示すように基板固定部6を基板支持部2上に基板5を収納したときに基板5の外周部に沿う位置に設けてよい。また、上面接合部3、底面接合部4は基板5が収納される周囲を取り囲む形状としたが、基板搬送治具を重ねることができるのなら上面接合部3は突起、底面接合部4は上面接合部3の突起と嵌合する凹部を有する構造としても構わない。逆に底面接合部4に突起があり、これに嵌合する凹部が上面接合部3となつても構わない。第二の実施例において、上面接合部3は引っ掛ける形状としたが基板搬送治具を重ねたときにきっちり接合するのであれば、簡単な凹凸形状としてもかまわない。また上面接合部、底面接合部にこだわらず、基板搬送治具の基板挿入口1以外の側面で各基板搬送治具を接合する止め具を設けてもかまわない。

【0023】図7では基板固定部6は基板5の最下端に1個だけ設けたが、半導体製造装置のアームにより基板5を取り出すことができるのならば、基板5の外周部に添って設けてもかまわない。

【0024】さらに、基板一枚単位で収納できる基板搬送治具の為、各基板搬送治具にバーコードなどに認識表

5

をつけ基板1枚ごとを認識し工程管理することも可能である。

【0025】

【発明の効果】以上のように本発明は基板搬送治具を基板一枚単位出収納できる板状の治具とし、板の側面には基板を水平方向に移動させて出し入れできる開口部と基板を出し入れするのに必要な半導体製造装置のアームが出入りできる空間と板の上部外周には突起と底部外周には前記上部外周の突起と合致する凹部を具備するという構成を備えたものであり、半導体製造装置は装置ローダー部、アンローダー部に前期基板搬送治具の底面の凹部と合致する突起あるいは凸部を備え、前期基板搬送治具と半導体製造装置内との間で基板の受渡を行なうアームを備えた構成とするを設けることにより、半導体装置の歩留り向上を図ることが出来る。

【図面の簡単な説明】

【図1】本発明の第1の実施例における基板搬送治具の概略図

【図2】同実施例における基板搬送治具の断面図

【図3】同実施例における動作説明のための半導体製造*20

* 装置及び基板搬送治具の断面図

【図4】同実施例における基板搬送治具の概略図

【図5】同実施例における基板搬送治具の断面図

【図6】本発明の第2の実施例における基板搬送治具の概略図

【図7】同実施例における基板搬送治具の断面図

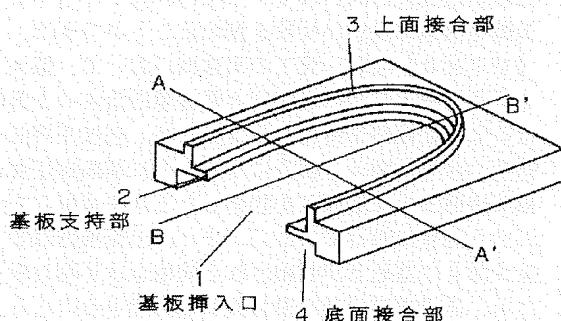
【図8】従来の基板搬送治具の概略図

【符号の説明】

1	基板挿入口
10	2 基板支持部
3	上面接合部
4	底面接合部
5	基板
6	基板固定部
7	蓋
10	10 半導体製造装置
11	11 アーム
20	20 開口部
21	21 基板支持部

【図1】

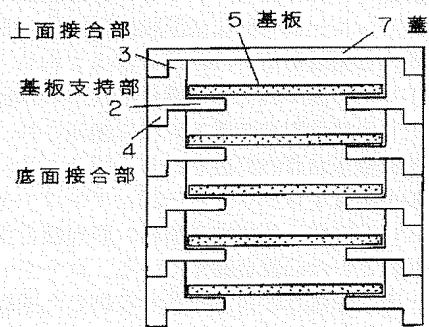
基板搬送治具概略図



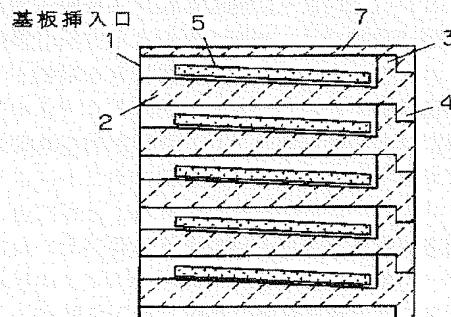
【図2】

基板搬送治具を重ねた場合の断面図

(A) A-A'断面図

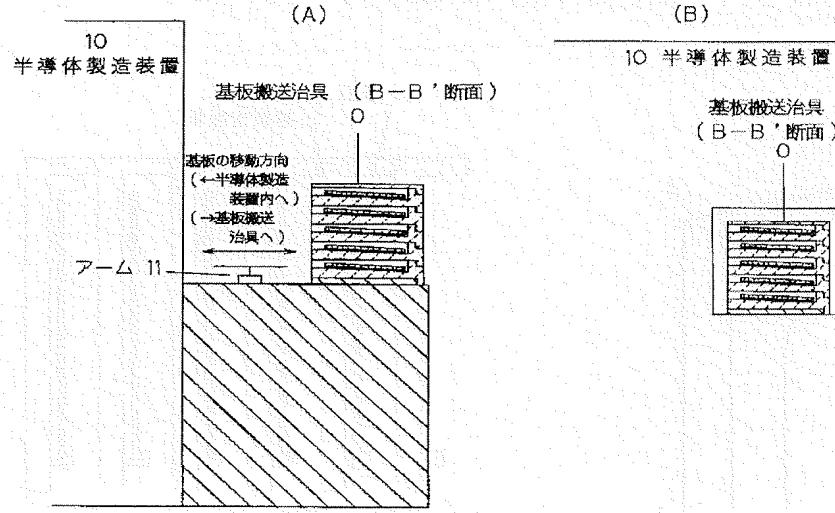


(B) B-B'断面図



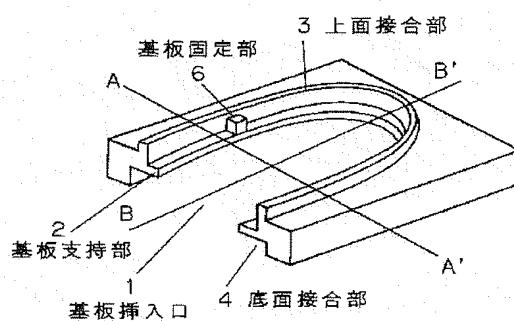
【図3】

基板搬送治具を半導体製造装置に設置したときの断面図



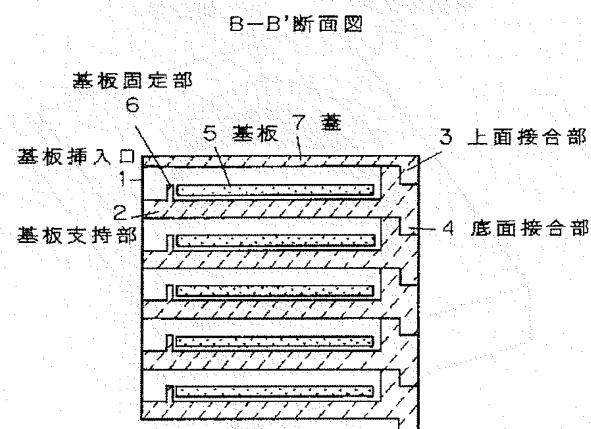
【図4】

基板搬送治具概略図



【図5】

図4の基板搬送治具を重ねた場合のB-B'断面図

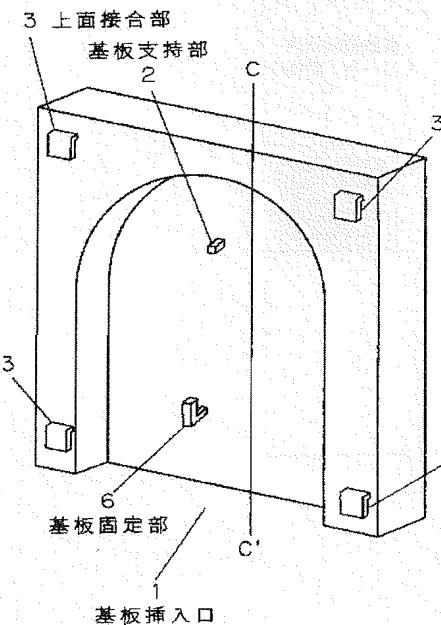


(6)

特開平9-8116

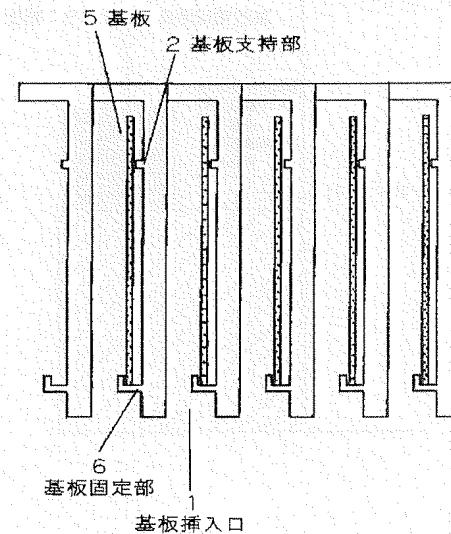
【図6】

基板搬送治具概略図



【図7】

基板搬送治具を6まい重ねた場合の断面図



【図8】

従来の基板搬送治具

